

**PATENT**  
**BTG-1002US/NC79329****Listing of Claims**

1. (Currently amended) A semiconductor device comprising:  
a substrate;  
a barrier film having a monolayer of elemental barium atoms on said substrate;  
and  
a metallic material ~~directly on~~ in physical contact with said barrier film.
2. (Currently amended) A semiconductor comprising:  
a semiconductor substrate material having a surface;  
a barrier film in direct contact with said semiconductor substrate surface, said barrier film having a layer comprising elemental barium atoms on said surface;  
a conductor ~~directly on~~ in physical contact with said barrier film, said conductor having a tendency to diffuse into said semiconductor substrate material if in direct contact therewith; and wherein said elemental barium atoms are between said conductor and said semiconductor substrate such that said layer serves as a barrier, inhibiting diffusion of the conductor into the semiconductor substrate material.
3. (Original) A semiconductor device according to claim 2, wherein said barrier film has a thickness of not more than approximately 100Å.
4. (Original) A semiconductor device according to claim 2, wherein said barrier film has a thickness of not more than approximately 20Å.
5. (Original) A semiconductor device according to claim 2, wherein said barrier film has a thickness of not more than approximately 5Å.
6. (Previously presented) A semiconductor device according to claim 2, wherein said barrier film is a single layer of elemental barium atoms on said surface of said substrate material.

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7. (Previously presented) A semiconductor device according to claim 2, wherein said barrier film comprises a plurality of contiguous layers of elemental barium atoms located on said surface of said substrate material.
8. (Original) A semiconductor device according to claim 2, in which said substrate material is a semiconductor.
9. (Original) A semiconductor device according to claim 2, in which said substrate material is a silicon semiconductor.
10. (Original) A semiconductor device according to claim 2, in which said substrate material is an insulating material.
11. (Original) A semiconductor device according to claim 2, in which said substrate material is silicon oxide.
12. (Original) A semiconductor device according to claim 2, in which the conductor is a metal.
13. (Original) A semiconductor device according to claim 2, in which the conductor comprises copper.
21. (Previously presented) A semiconductor device according to claim 1, wherein said barrier film comprises a plurality of contiguous monolayers of barium atoms located on a surface of said substrate material.
23. (Currently Amended) A semiconductor device comprising:  
a semiconductor substrate;  
a barrier film comprising elemental barium atoms, having a thickness in the range of approximately 5 Å to approximately 100 Å in direct contact with said substrate; and

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a metallic material ~~positioned directly on~~ in physical contact with said barrier film such that said elemental barium atoms are between said metallic material and said semiconductor substrate.

24. (Previously presented) The semiconductor device according to claim 23, wherein said barrier film has a thickness in the range of approximately 5 Å to approximately 20 Å.

25. (Previously presented) The semiconductor device according to claim 23, wherein said substrate comprises semiconductor silicon, and said barrier film directly contacts said substrate.

26. (Previously presented) The semiconductor device according to claim 2, wherein said barrier film has a thickness in the range of approximately 5 Å to approximately 20 Å.

27. (Previously presented) The semiconductor device according to claim 1, wherein said substrate comprises semiconductor silicon, and said barrier film directly contacts said substrate.

28. (Previously presented) The semiconductor device according to claim 8, wherein barrier film directly contacts said substrate.